WATERMELON DISEASES

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In 1920 there were planted in Florida 28,170 acres of watermelons. From this acreage it is estimated that about 6,707 cars were shipped. When the seed are planted 10 x 10 there are grown 425 hills of watermelons per acre. The estimated yield per acre in this state is 323 melons, or less than one marketable melon per hill. And it is further shown from the above data that practically only one-fourth of a car is raised per acre. The question naturally rises why is our yield so low?

Factors Influencing Yield

The factors influencing the watermelon yield are: Soil fertility, drought, poor cultivation, insects and fungus diseases.

Disease Control

In different localities growers experience trouble with various diseases. Some sections are infected with anthracnose, while others are bothered with wilt, and in still other places they are fighting aphids or root-knot. I will first take up some general methods of disease control and later in the text take up control for the specific diseases.

Some diseases are introduced with the seed. Each grower should demand clean seed. Seed obtained from disease free melons. Anthracnose and stem blight are carried on the seed. If diseased melons are used as a source of seed the fungus spores are sure to be scraped off from the melons while the seed are being obtained. These spores adhere to the seed and the conditions which are favorable for the seed are ideal for the fungus, hence the young plants are soon infected. All seed should be treated with bi-chloride of mercury 1-1000 before they are planted. The bi-chloride can be obtained in tablets and should be used according to the directions. The seed should soak

five minutes in the bi-chloride solution and then be rinsed in fresh water and let dry before planting.

Some diseases are brought into the field with manure and composts. Old vines should not be used as compost. They should be destroyed. All vines and culls should be removed from the field. If these are allowed to remain in the field and decay, disease is buried in the soil and makes it impossible to raise a second crop of melons. Therefore two steps toward securing a good crop are to treat and remove all trash such as vines and culls from the field.

The two most important watermelon diseases in Florida are Anthracnose and Stem-End Decay.

ANTHRACNOSE

Anthracnose attacks the vines, leaf and fruit. The markings on the leaf and stem are dark irregular dead spots. The leaves dry up and die prematurely and the vines die leaving the immature melons exposed to the sun's rays. (Fig. 6.) The markings on the melons at first have a water soaked appearance;

FIG. 6.—Field of watermelons not sprayed affected with anthracnose.

later they become shrunken and covered with a pink sticky mass of spores. (Fig. 7.)

Cause of Anthracnose

Anthracnose is caused by a fungus which attacks not only the watermelon but cucumbers, cantaloupes and other plants belonging to this family. The fungus is also a plant and begins with a spore (seed-like body) which is brought in contact

FIG. 7.—Anthracnose on melons.

with the melon, vine or leaf; here it germinates and grows into the plant and develops as a mold-like thread. The fungus must have moisture to develop therefore during a dry season it may be present but not in large enough quantities to attract attention or do much harm. When enough moisture is present the fungus develops rapidly. It has a peculiar habit of being able to remain dormant in the melon and when the ideal conditions present themselves it grows rapidly. That is the reason so many melons become spotted on the way to market. Many carloads of melons leave the loading station in good condition but when they arrive on the market they are spotted. The reports of

the Bureau of Markets Inspection for last year show that over five percent of the melons coming out of Florida were spotted.*

Control of Anthracnose

This disease can be controlled by spraying with Bordeaux mixture. The first spraying should be made when the vines begin to run and repeat the spraying about every two weeks. However, if the season is rainy the spraying should be done more often since the disease spreads more rapidly during this time. The spraying should be done with a high power sprayer which is able to develop a pressure of 140 to 200 pounds. Thorough spraying is the key to success. The under side of the leaf as well as the upper side should be covered as much as practicable. About one hundred gallons should be used per acre. (Fig. 8.)

Bordeaux Mixture

The Bordeaux mixture should be the 4-4-50. That is, four pounds of blue stone, four pounds of quicklime and fifty gallons of water are used in the mixture. Dissolve 50 pounds of blue stone in water, add water to make fifty gallons. Slack 50 pounds of quicklime and make up to fifty gallons with water.

Fig. 8.—Watermelon field sprayed with bordeaux mixture to control anthracnose.

*F. C. Meier, U. S. D. A. Bureau of Markets.

Then when making the solution add four gallons of blue stone solution to 21 gallons of water and in another barrel add four gallons of the lime water to 21 gallons of water. Then pour the two solutions into the sprayer simultaneously thus making the fifty gallons of Bordeaux. The solution should be stirred while mixing the blue stone and lime. A fine wire mesh should be used to strain out the large particles.

The spray machine should deliver the mixture at least under 150 pounds pressure. Three leads of hose should be used (Fig. 9) each hose being from 20 to 30 feet long. With such

FIG. 9.—Spraying outfit showing three leads of hose in use.

an outfit at least 25 acres can be sprayed a day at a total cost of $.80 to $1.25 per acre.

STEM-END DECAY

One of the worst diseases in Florida watermelons is Stem-End Decay. This disease does considerable damage in the field but the greatest loss occurs on the way to market. The melons are loaded apparently sound, but when they arrive in a northern market they have begun to decay at the stem end. Frequently one-half to one-fourth of the melon is soft. Many

times, however, there is only a slight softening about the stem end. It is a practice of the buyer while unloading the melons to press his thumb against the stem end of the melon while in the act of passing the melon out of the car. If the melon is soft to the touch it is rejected.

Last year the U. S. Department of Agriculture inspected 151 cars of melons from Florida. These showed an average of 16.6 percent decay.

Cause of Decay

The fungus Diplodia is responsible for this great loss. The fungus lives on dead or dying vegetation. The spores are scattered by the wind and are present to enter a melon if a wound is made. This fungus produces decay in citrus fruits, sweet potatoes, cotton bolls, cocoanuts, and sometimes causes a severe gumming of peach trees.

Infection

When a melon is cut from the vine a drop of sap exudes from the melon. The spore is carried to the cut surface by the wind or the hands of the workmen. Here it finds a suitable medium

FIG. 10.—Showing the stems being recut after melons are in car.

to grow. It germinates and a fine mold-like thread begins to grow in at the stem end. The first signs of the disease are a drying and shrivelling of the stem. Decay begins where the melon is attached to the stem. The flesh softens and has a water soaked appearance. The decay progresses down the melon at the rate of 1½ inches a day under moist conditions. This decay, however, will attack the melon on the side if there is a wound which allows the fungus to enter.

Control

After each season all diseased vines and decayed melons should be removed from the field. During the season as a decayed melon is found it should be removed from the field. Care must be taken in handling the melons that they do not become bruised.

As the melons are being loaded in the car a man should recut the stems (Fig. 10) and then this cut surface should be covered with a bluestone paste (Fig. 11). The paste should be applied with a brush. The Bordeaux paste can be bought ready for use or it can be made according to the following recipe.

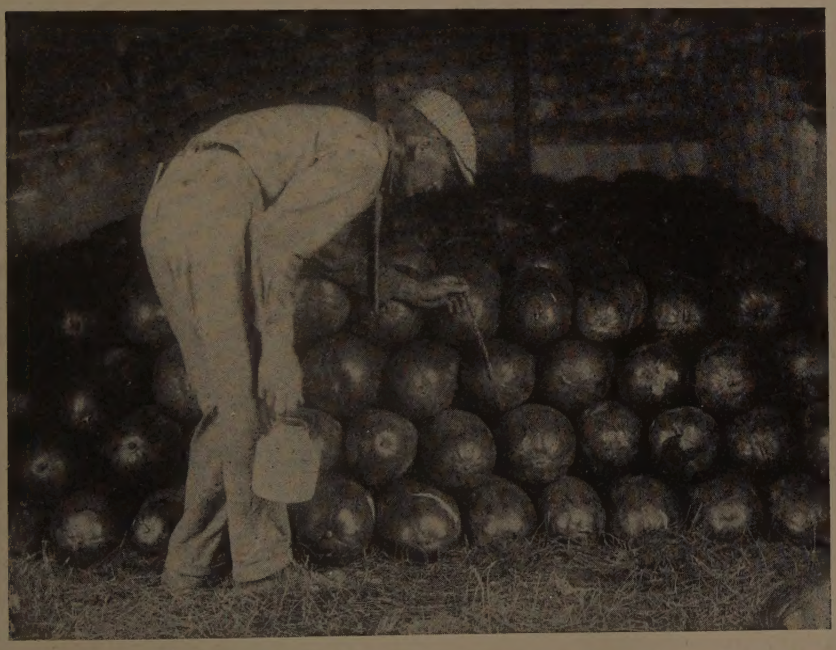

FIG. 11.—Applying bordeaux paste after recutting the stems to prevent stem end rot. A small brush is being used and care taken to apply the paste only to the cut end of the stem. This car was shipped to St. Louis, Mo.

Bordeaux Paste

Place 3½ quarts of water in an enamel-ware kettle and add 8 ounces of blue stone and bring to a boil. While this mixture is boiling mix 4 ounces of starch with a pint of cold water. Stir the starch until a milky mixture is obtained. As soon as the blue stone is dissolved and the mixture boiling add the starch slowly stirring the mixture all the while. Continue the boiling and stirring of the mixture until it thickens into an even paste. The boiling should last only one or two minutes after the starch is added. The paste must not become too thick as it will not be easily applied with a brush. It should be the consistency of thick paint. A paste made from the commercial dry Bordeaux will also do if not too thick. This paste serves as a disinfectant and kills the germinating spores if they are present. It has been proven beyond doubt that this paste enables the melons to arrive in the market without stem-end decay.

Aphids

If aphids are present in the field 1 pint of the Black Leaf Forty should be added to every 100 gallons of Bordeaux mixture when spraying for Anthracnose.

Summary

1. Plant disease-free seed.
2. If disease-free seed are not obtainable disinfect before planting with corrosive sublimate.
3. Spray the first time when vines begin to run, and repeat the spraying about every other week. In case of dry weather the second spraying may be omitted.
4. If aphids are present put Black Leaf Forty in Bordeaux mixture when spraying.
5. Recut stems of melons when loading. Cover the recut surface with Bordeaux paste.
6. Remove all dead and diseased vines from the field. Also remove all diseased and cull melons.